

Eric David Wallin

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I am primarily a digital designer for reprogrammable logic devices (i.e. FPGAs) with side experience in mixed signal and analog design.

I have designed many types of digital structures including soft processors, DPLLs, TSIs, UARTs, I2C & SPI, UTOPIA interfaces, FIFOs, Ethernet packet and ATM cell FIFOs, watchdog timers, and processor register sets with local bus bridges.

CAREER EXPERIENCE

The D-Lev Project – *Digital Theremin Designer* – 2010 to Present

- Extensive research into capacitive field generation, human body measurements, FEA analysis of various antenna geometries.
- Field coil optimization research via custom inductor design software.
- Discovered Gamma function linearization of the fields.
- Designed a formant based music synthesizer, with FM & AM.
- Visual pitch & volume display, sculpture mode, MIDI output.
- HIVE: A novel register/stack hybrid, 32-Bit, multi-threaded, barrel pipelined System Verilog soft processor core.
- Simulator, HAL assembly language, fixed and floating point math libraries.
- Extensive User Manual, preset librarian.
- 50 kits deployed internationally, many of the world's best Thereminists own and have concertized with the D-Lev.
- Two interactive sculptures have incorporated the D-Lev.

Alcatel-Lucent – *Member of Technical Staff* – 1998 to 2009

- Architected, designed, and implemented the main packet buffer on an eight line GPON Line Termination (GLT8) unit, including a pool of linked lists maintained in FPGA BRAM and external DDR2 and QDR.
- Implemented the packet processing sections of several flavors of GPON Multi Dwelling Units (MDUs) including VDSL and gigabit Ethernet variants.
- Responsible for system timing, the specification and design of solutions that include the use of PLLs and DPLLs with analysis tools that I wrote.

University of Virginia – *Circuit Design Consultant* – 1997

- Designed and implemented a prototype mid-infrared LED / thin film spectrometry-based CO2 detector for a project funded by the Virginia Patent Foundation. This was a mixed analog / digital design.

American GFM – *Various* – 1985 to 1993

- *Assistant Mechanical Engineer*: Performed experiments on customer materials and blades in our ultrasonic cutting lab, fielded customer inquiries, wrote the programming and maintenance manuals for these machines.
- *CNC Programmer*: Programmed three and four axis vertical and horizontal CNC milling machines, metal plate torch cutter. Responsible for choice of tooling, setups, and design and manufacture of any necessary fixtures.
- *CNC Machinist*: Operated three-axis vertical mill on a wide variety of jobs, mostly short-run, close tolerance work.

SKILLS

- Digital Design
- Analog Design
- PCB Layout
- System Verilog
- VHDL
- Golang, C++
- Documentation

EDUCATION

- Master of Science in Electrical Engineering, University of Virginia, Charlottesville, VA, 1998
- Bachelor of Science in Electrical Engineering University of Virginia, Charlottesville, VA, 1996

PUBLICATIONS

- *Gem of the Mountains* – Boonton Historical Society & Museum Newsletter, 2003 to present.
- *Delta-Sigma Waveguides for Music Synthesis* – Computer Music Journal, 1999, Vol.23, Issue 4.
- *An Optical Sensor for Gas Monitoring* – Proceedings of the ISDRS, 1997.

AWARDS

- Kevin M. Hale Publication Award, 2020, 2021, 2022, 2024.
- The 1996 Lewis T. Rader Award for Academic Excellence, 1996
- Old Crows Capitol Club undergraduate scholarship, 1995 & 1996.